

NSLS Drought Mitigation Plans

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APSUO/PUC Meeting

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Background

- As many of you know, NSLS is scheduled to be shut down at the end of FY14 (September 2014).
- NSLS II should be operational at that time, but with limited beamlines and beamtime for User Programs.
- For the last year or so, representatives of NSLS (Johnson), ALS (Banda), APS (Mills), and SSRL (Pianetta) have had regular conference calls to discuss/plan for this.
- We looked at “low cost” approaches to turn on additional capacity at each of the facilities by:
 - Improved instrumentation (one-time costs)
 - Additional new staffing (recurring costs)
 - Possibility of short term transfer of staff based at NSLS to the other facilities
- Each of the facilities developed a Table describing the potential increases in capacity and these were discussed with Peter Lee (BES) last week at the BESAC meeting.



NSLS II Planned Ramp-Up of Operations

Scheduled Activities	FY14		FY15		FY16		FY17	
	Comments	Time Schedule d [h]	Comments	Time Scheduled [h]	Comments	Time Schedule d [h]	Comments	Time Schedule d [h]
Scheduled Operating Period [h]		3888		5952		6624		7320
Time needed for ID commissioning [h]	NSLS-II Project	1280	ABBIX Devices IVU21(2),IVU23	452	EPU105,EPU57, IVU23 (2)	427	none	0
Time needed for FE commissioning [h]	SRX, CSX, CHX, HXN, SRX, IXS	1020	FMX, AMX, LIX, NxtGen (3)	960	NEXT, NxtGen (3)	1360	NextGen	429
Time needed for Beamline Commissioning [h]	NSLS-II Baseline beamlines	120	ABBIX, NEXTGen	151	NEXT, NxtGen(3)	160	NextGen	51
Time needed High Intensity commissioning [h]	0 steps a 50mA	0	5 steps a 50mA	565	3 steps a 50mA	320	2 steps a 25mA	202
Time scheduled for Maintenance [h]	12h/week	278	12h/week	425	12h/week	473	12h/week	523
Time needed general for Accelerator Studies [h]	30 h /week	463	24 h /week	850	24 hrs /week	946	24 hrs /week	1046
Time needed for Vacuum recovery [h]	90 h/incident	0	3 incidents a 80 h	254	3 incidents a 75 h	240	3 incidents a 75 h	227
Scheduled Large Shutdown [d]	0 d	0	2 shutdown a 45 d	2160	3 shutdowns a 30 d	2160	3 a 20 d	1440
Operational Efficiency/loss of operations time [h]	80%	722	85%	829	90%	615	95%	340
User Operation	19%	727	39%	2295	41%	2698	66%	4842
Max Beam Current [mA]		50		300		400		500
Actual User Time with Beam		582		1951		2428		4600



APS Table of Potential Increase in Capacity

Relative to FY12							As of April 2013				Additional Capacity Remaining				Priority
Beamline (Operator)	Current Techniques	Potential Techniques	Possible Capacity Increase (in BLs)	Possible Increase in Unique Users *	One-time Costs (K\$)	Recurring Costs (K\$)	To Date Capacity Increase (in BLs)	To Date Increase in Unique Users *	One-time Costs Committed (K\$)	Recurring Costs Committed (K\$)	Remaining Capacity Increase (in BLs)	Remaining Increase in Unique Users *	One-time Costs Additional Required (K\$)	Recurring Costs Additional Required (K\$)	
9-BM (XSD)	XAFS	XAFS	0.50	50	550	400	0.50	50	200 (EXXON) 200 (BES transit.) 150 (APS ops)	175 (EXXON) 225 (APS ops)	0	0	0	0	0
11-BM (XSD)	powder diff.	powder diff.	0.20	20	0	0	0.20	20	0	0	0	0	0	0	0
12-BM (XSD)	XAFS & diffraction	XAFS & diffraction	0.25	25	480	0	0.25	25	300 (EXXON) 180 (APS det pool)	0	0	0	0	0	0
6-BM (XSD)	not operating	HP - white beam	1.0	100	500	400	0.50	50	100 (BES transit.) 400 (COMPRES)	200 (COMPRES)	0.50	50	0	200	1
13-BM-C (GSE CARS)	surface scat. & DAC	surface scat & DAC	0.50	50	200	0	0	0	50 (APS ops for xtals - pending)	0	0.50	50	150 for KB system	0	2
5-BM-C (DND CAT)	powder & μ CT	powder, μ CT & DAC	0.25	25	150	0	0	0	0	0	0.25	25	150 for KB system	0	2
17-BM-B (MCA/XSD)	PX	powder diffraction	0.25	25	0	175	0	0	0	0	0.25	25	0	175	3
33-BM-C (XSD)	diff. & surface scattering	diff. & surface scattering	0.25	25	0	175	0	0	0	0	0.25	25	0	175	3
10-BM (MR CAT)	XAFS	XAFS	0.15	15	0	100	0	0	0	0	0.15	15	0	100	4
2-BM (XSD)	tomography	tomography	0.20	20	0	175	0	0	0	0	0.20	20	0	175	4
1-BM (XSD)	powder diffraction	scattering & topography	0.50	50	85	225	0	0	0	0	0.50	50	85 for goniometer	225	4
8-BM (XSD)	μ fluorescence	μ fluorescence	0.25	25	125	225	0	0	0	0	0.25	25	125 for KB sys.	225	4
Physical Science Beamline Totals			4.30	430	2090	1875	1.45	145	1580	600	2.85	285	510	1275	
19-BM-D (SBC CAT)	PX	PX	0.1	20	0	0	0.1	20	0	0	0	0	0	0	
22-BM-B (SER CAT)	PX	PX	0.25	50	0	100	0	0	0	0	0.25	50	0	100	
23-BM-B (GM/CA)	PX	PX	0.25	50	0	100	0	0	0	0	0.25	50	0	100	
14-BM-C (BioCARS)	PX	PX	0.50	100	0	225	0	0	0	0	0.50	100	0	225	
14-BM-D (BioCARS)	not operating	HP-DAC	1.0	200	700	625	0	0	0	0	1.0	200	700 for optics/contrls	625	
24-BM-B (NE CAT)	not operating	white beam capable	1.0	200	500	625	0	0	0	0	1.0	200	500 for optics/contrls	625	
Life Science Beamline Totals			3.10	620	1200	1675	.1	20	0	0	3.0	600	1200	1675	
GRAND TOTAL			7.40	1050	3290	3550	1.55	165	1580	600	5.85	885	1710	2950	

Mapping of Capacity Increase onto the NSLS

Technique	NSLS FY12 Station Hours	Sub'n (Ave Ratio)		FY14	FY15	NSLS-II FY16	FY17		Facility	Beamline
Spectroscopy										
Low Energy Spectroscopy										
IR	16,889	1.8					MET/FIS		ALS	1.4
									ALS	5.4.3
Soft X-ray Spectroscopy										
Soft / UV	24,318	2.1			SST-2	SST-1	ESM		SSRL	8-1, 8-2, 10-1
Tender X-ray	11,611	2.3				TES			ALS	9.3.1
									SSRL	14-3
Hard X-ray Spectroscopy										
Hard X-ray	37,140	1.7			QAS	BMM	ISS		APS	9-BM
									APS	10-BM
									APS	12-BM
									SSRL	2-2
									SSRL	4-1, 4-3, 7-3
Optics/Calibration/Metrology										
Optics/Metrology	10,474	0.7					MID			

- Erik Johnson developed Tables (example above) mapping potential capacity increases on to the existing beamline/programs at NSLS. Tables were made for:
 - Spectroscopy
 - Scattering and diffraction
 - Imaging

Key	
ID based lines in Bold Text	
NSLS-II Project	
NEXT	
ABBIX	
Partner	
NxtGen	
Other	

APS Situation

- We have already begun this process through:
 - a Partner User Proposal with the EXXON group on 9-BM and 12-BM plus additional funds received this year from BES to support the NSLS II transition
 - a “mini-CAT” arrangement with COMPRES for high pressure studies on 6-BM (white beam) plus additional funds received this year from BES to support the NSLS II transition
- We are in discussions with the energy dispersive diffraction community (J. Parise – point of contact) to use the white beam in 6-BM for that program as well.
- BES has told us that we can expect additional funds this year to work down our priority list to turn on additional capacity.
- Given that information, we will be developing a plan on how best to use those funds based on:
 - Further discussions with NSLS
 - Discussions with CATs whose beamlines appear in the Table
 - Looking at programs that might remain at APS even when NSLS II is operational
 - XSD plans for hiring staff

